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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Chemistry and Engineering

Carbohydrate Research Division

CANDELILLA WAX

Candelilla wax is obtained from the Pedilanthus pavonis plant as well as from the Euphorbia antisyphilitica, both of which belong to the Euphorbiaceae family. The plants are found on the mountains and hillsides in the semi-arid highland regions of Mexico and southwest Texas. The commercial production of the wax appears to be largely confined to the Mexican States of Coahuila, Chihuahua, Durango, Nuevo Leon, and Zacatecas.

The candelilla plant (Pedilanthus pavonis) consists of numerous slender cylindrical stalks which range in height from 2 to 5 feet. The quantity of wax which coats the stalks usually ranges from 3 to 5 percent of the weight of air-dried plants, but in some localities is much smaller.

The plants are harvested during the dry season, when their wax content is greatest, and delivered to extraction plants. After the plants have become thoroughly dried, they are put into vats or tanks (either whole or cut into pieces) and boiled with water acidulated with sulfuric acid. The wax which collects on the surface of the water is removed and usually treated one or more times again with acidulated boiling water in order to remove as much as possible of the entrained foreign matter. Next the wax is heated until the residual water is volatilized, then poured into pans. When cold, the wax is removed from the pans, and the lower portions of the cakes, which contain the settled foreign matter, are cut off and saved if desirable for a further recovery of wax. The trimmed cakes of wax are broken into pieces, bagged and sold. However, some of the larger firms treat the molten wax with bleaching earth and activated char, then filter the mixture through heated filter presses. Others bleach it by exposing thin sheets of the wax to direct sunlight for from 15 to 25 days, during which period the wax is occasionally sprayed with a 1:1 mixture of alcohol and turpentine containing a little (1 to 2 percent) oleic acid.

The yield of unbleached clarified crude wax ranges from 1.5 to 2 percent of the weight of the air-dried plants. Although solvent extraction methods were devised many years ago, with which much larger yields can be obtained, it appears that most of the wax is still obtained by boiling the plants in water. In recent years, the annual production of wax in Mexico has ranged from 1,000 to 1,500 long tons, but at times it is much larger.

Unlike carnauba wax, no commercial grades for candelilla wax have been established by the trade.

The unbleached or slightly bleached product varies considerably in properties, and melts anywhere from 66° to 73° C. It gives an acid value of from 12 to 21, an iodine number of from 5 to 35, and a saponification value usually within the range of 46 to 65, but sometimes higher.

The chief uses of this wax are in the manufacture of shoe, furniture, and other polishes, phonograph records, wax papers, and electrical insulation preparations.

Information on candelilla wax will be found in the following publications:

"Candelilla: A Technical and Economic Study," by M. G. Cruz, Monthly Bulletin of Agricultural Science and Practice (International Institute of Agriculture, Rome), vol. 30, pp. 85T-99T (1939).

"Waxes: A Brief Study of the Polishing Waxes," by M. J. Hausman, Soap, vol. 12, no. 8, pp. 95-97 (1936).

"Waxes: Animal, Mineral, Vegetable and Snythetic," by Ibert Mellan, Chemical Industries, vol. 37, pp. 539-545 (1935).

"Wax From Weeds," by F. LeRoi Thurmond, Chemical and Metallurgical Engineering, vol. 31, p. 782 (1924).

Many city, university and agricultural experiment station libraries have some or all of these publications.